the objection or specifically identify what is unclear about how to calculate k(w,h,i) values.

Claim 16 stands under objection as being improperly dependent from both Claims 13 and 5. Currently amended Claim 16 is only dependent from Claim 13, thereby obviating this objection.

Claims 13-25 stand rejected under 35 USC112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter with the Applicant regards as the invention. MPEP 2171 requires an Examiner to explain if the basis for a 35 USC 112, second paragraph rejection is indefiniteness or the failure to claim what the Applicant regards as their invention. Since the Office provides no argument for the latter, Applicant assumes the reason is for indefiniteness alone.

The Office supports an argument for indefiniteness by stating that Claims 13-25:

(a) are "generally narrative and indefinite";
(b) are "fail to conform to current U.S. practice";
(c) are "replete with grammatical and idiomatic errors";
(d) parameters w, h, and i are not defined; and
(e) Claim 13 lacks antecedent basis for "the desired reflectance values ...".

Applicant believes present amendments obviate issues (b), (c), (d) and (e). In regards to being "generally narrative", MPEP 2170.01 indicates Applicant can use "... any style of expression or format of claim which makes clear the boundaries of the subject matter for which protection is sought". Applicant believes boundaries are defined in each claim. Therefore, Applicant fails to see why being generally narrative in nature is grounds for rejection and respectfully invites the Examiner, if desiring to maintain the rejection, to provide more specific reasons for the rejection.

Claims 1-3 and 7 stand rejected as anticipated by Osumi et al. (US 6,362,885) under 35 USC 102(e). Applicant further assumes that the Office finds the same reference to anticipate Claims 4-6 and 8-12, though the Office Action does not specifically say so. Applicant respectfully disagrees with these rejections.

The invention of Claims 1-12 in the present Application involve determining surface reflection values, $k_l(w,h,i)$, from a *single* object. This is evident in the original claims, which refer to "an object" and provide no further suggestion of any additional objects. It is further evident from the specification, which describes determining surface reflection values from a single object using, for example, Equation (4). Presently amended Claim 1 makes even more clear the fact that the determination uses a single object. Claims 2-12, which depend from Claim 1, also involve determining a surface reflection from a single object.

In contrast, Osumi et al. requires two objects – a black and a white object – to determine surface reflection values (*see*, column 13, lines 24-53 of Osumi et al.). Applicant fails to find any teaching or suggestion in Osumi et al. that would enable or motivate a skilled artisan to even try to determine a surface reflection value from a *single* object. Therefore, Applicant believes Claims 1-12 of the present Application are novel over Osumi et al.

The office suggests that the parameters w, h, and i in Claim 7 lack definition. Currently amended Claim 7 resolves this issue.

Applicant thanks the Examiner for indicating Claims 13-25 are allowable upon overcoming issues associated with the 35 USC 112, second paragraph rejection. Applicant believes those issues have been resolved with the presently amended claims.

In view of the above remarks, Applicant respectfully requests that the Office withdraw the current rejections and objections and issue of a Notice of Allowance for Claims 1-25 of the present Application.

Respectfully submitted,

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Equation Amendments

$$R_{m_{test}}(w,h,i) = k_1(w,h,i) + \frac{(1-k_1(w))(1-k_2)R_i(w)}{1-k_2R_i(w)} \quad (3)$$

$$k_1(w,h,i) = R_{m_{test}}(w,h,i) - \frac{(1-k_1(w))(1-k_2)R_i(w)}{1-k_2R_i(w)} \quad (4)$$

$$R_p(w,h,i) = k_1(w,h,i) + \frac{(1-k_1(w))(1-k_2)R_i(w)}{1-k_2R_i(w)} \quad (7)$$

Amended Claims

1. (Once Amended) A method for characterizing a surface contribution to ~~the appearance of~~ an object's appearance; the method comprising ~~the step of~~ determining from the object ~~the surface contribution to appearance or the~~ surface reflection values $k_l(w,h,i)$, from a plurality of reflectance values $R_m(w,h,i)$ which are established for at least one light frequency (w) and a plurality of combinations of viewing (h) and illumination (i) angles.

2. (Once Amended) The method according to claim 1 wherein ~~the surface contribution to appearance, or~~ the surface reflection values $k_l(w,h,i)$, are calculated from at least two different reflectance values $R_m(w,h,i)$ established for a predetermined combination of viewing and illumination angles ~~(h,i) and~~ using directional light.

3. (Once Amended) The method of claim 1 wherein $k_l(w,h,i)$ ~~is~~ values are calculated from ~~an~~ idealized reflectance value(s) $R_i(w)$ for light frequency or frequencies (w), and the measured reflectance values $R_m(w,h,i)$ using a color theory equation.

4. (Once Amended) The method of Claim 3 wherein the color theory equation has been assumed to be independent of the viewing and illumination angles and defines a relation between the idealized reflectance value(s) $R_i(w)$, a viewing and illumination angle-independent surface reflection value(s) $k_l(w)$, and ~~the~~ reflectance value(s) $R_m(w)$ which ~~is~~ are measurable independently of the viewing and illumination angles, with $k_l(w,h,i)$ being calculated by substituting one occurrence of $k_l(w)$ with $k_l(w,h,i)$ and replacing $R_m(w)$ ~~is replaced by~~ with $R_m(w,h,i)$ in this equation, and subsequently calculating $k_l(w,h,i)$ from this equation.

5. (Once Amended) The method of claim 4 characterized in that each surface reflection value $k_l(w,h,i)$ is calculated by solving $k_l(w,h,i)$ from said equation for each value of $R_m(w,h,i)$ and the value(s) of $R_i(w)$.

6. (Original) The method of claim 4 wherein the object has a black color.

7. (Once Amended) A method for predicting ~~the~~ an appearance of an object wherein the method comprises predicting the appearance of the object at predetermined viewing (h) and illumination (i) angles and at least one light frequency (w) based on ~~the~~ color determining parameters of the material from which the object is manufactured and a plurality of surface reflection values $k_1(w,h,i)$ that represent ~~the~~ a surface contribution to the appearance ~~or plurality of surface reflection values $k_1(w,h,i)$~~ for a predetermined plurality of combinations of viewing and illumination angles and at least one light frequency (w).

8. (Once Amended) The method according to claim 7 wherein, ~~on the basis of the color determining parameters of the material the~~ an idealized reflectance value $R_i(w)$ of the object is calculated based on the color determining parameters of the material from which the object is manufactured and subsequently ~~the~~ a prediction of ~~the~~ observed appearances for the object as viewed at a plurality of combinations of viewing and illumination angle(s) ~~is carried out~~ by calculating a plurality of reflectance values $R_p(w,h,i)$ using the viewing and illumination angle(s), the reflectance value $R_p(w,h,i)$ being calculated using an equation from a color theory, ~~which~~ the equation ~~has been~~ being assumed to be independent of the viewing and illumination angles ~~(h,i)~~ and ~~defines~~defining a relation between the idealized reflectance value $R_i(w)$, ~~the~~ an angle-independent surface reflection $k_1(w)$ and ~~the~~ an angle-independent reflectance value $R_p(w)$ ~~that is measurable in the known angle independent manner~~, with $R_p(w,h,i)$ being calculated at ~~the~~a combination of viewing and illumination angles ~~on the basis of~~ and ~~this equation~~ by setting $R_p(w,h,i)$ ~~is set~~ equal to $R_p(w)$ and replacing one $k_1(w)$ ~~is replaced by~~ with $k_1(w,h,i)$ in this equation and by subsequently solving $R_p(w,h,i)$ from this equation ~~on the basis of~~ using the idealized reflectance $R_i(w)$ and the surface reflection $k_1(w,h,i)$.

9. (Once Amended) The method according to claim 8 wherein the values of $k_1(w,h,i)$ are determined ~~for~~ from a test object manufactured from a material and with a surface texture corresponding ~~with~~ to the kind of material and ~~the~~ predetermined surface texture of a sample object to be made in a later stage~~, while subsequently o the basis of color determining parameter of the material, the value of $k_1(w,h,i)$ is obtained~~.

10. (Once Amended) The method according claim 9 wherein ~~the~~an appearance of the ~~test~~sample object is predicted at ~~the~~ a plurality of combinations of predetermined viewing ~~(h)~~ and illumination ~~(i)~~ angles based on the color determining parameters of the material from which the sample object is manufactured and ~~a~~ the plurality of reflection values $k_l(w,h,i)$ obtained from the test object for a plurality of combinations ~~(h,i)~~ of viewing and illumination angles.

11. (Once Amended) The method according to claim 10 wherein the plurality of surface reflection values $k_l(w,h,i)$ obtained from the test object are respectively determined ~~on the bases of~~ from a plurality of corresponding reflectance values $R_m(w,h,i)$ of the test object.

12. (Original) The method of claim 11 wherein the test object has a black color.

13. (Once Amended) A method for matching ~~the~~ an appearance of an object with a reference object; the method comprising the steps of:

~~A.~~ (a) measuring or otherwise selecting reflectance values $Rm_{ref}(w,h,i)$ of the reference object using at least one light of frequency (w) and ~~at~~ a plurality of predetermined viewing angles (h) and illumination ~~(i)~~ angle~~(s)~~ (i);

~~B.~~ (b) measuring ~~the~~ reflectance values $R_{mtest}(w,h,i)$ of a test object manufactured by a pre-selected method from a pre-selected material having a pre-selected amount and type of colorant(s) and/or other additive(s) ~~using pre selected method of manufacture~~;

~~C.~~(c) calculating ~~the~~ values for a surface contribution to appearance ~~or the reflection value(s)~~ $k_l(w,h,i)$ of the test object from reflectance values $Rm_{test}(w,h,i)$ ~~Rp(w,h,i) associated with the predetermined viewing (h) and illumination (i) angles~~;

~~D.~~ (d) making a sample object with predicted reflectance values $R_p(w,h,i)$ by selecting a surface texture similar to that of the test object and characterized by $k_l(w,h,i)$ values and a composition such that $R_p(w,h,i)$ values that are predicted to be similar to $Rm_{ref}(w,h,i)$ values ~~making a sample object predicted to have the reflectance value(s) $R_r(w,h,i)$ from~~

~~the $k_t(w,h,i)$ values measured in C. with the desired reflectance value(s) $Rm_{ref}(w,h,i)$ of the reference object;~~

~~E.~~ (e) comparing the reflectance values measured on the sample object from step ~~D.~~ (d) with ~~that of the reflectance value~~those of the reference object; and

~~F.~~ (f) repeating, as desired, steps ~~B, C, D, and E using~~ (b), (c), (d), and (e) changing the surface texture or the amount or type of colorants, other additives or manufacturing process until the appearance match between the first and second object is acceptable.

14. (Once Amended) The method according to claim 13 wherein the test object in step ~~B.~~(b) has a black color.

15. (Once Amended) The method of claim 13 wherein ~~surface contribution to appearance or~~ the surface reflection values $k_i(w,h,i)$ of the test object ~~is~~ are determined based on a preselected material and surface texture.

16. (Once Amended) The method according to claim 13 wherein a test object is manufactured from a preselected material and surface texture and ~~the surface contribution to appearance or~~ the value(s) $k_i(w,h,i)$ for the viewing and illumination angle(s) is calculated ~~according to the method of claim 5~~ by solving $k_i(w,h,i)$ for each value of $R_m(w,h,i)$ and an idealized reflectance value $R_i(w)$ from a color theory equation that has been assumed to be independent of viewing and illumination angles and that defines a relation between $R_i(w)$, a viewing and illumination angle-independent surface reflection $k_i(w)$, and a reflectance value $R_m(w)$ which is measurable independently of the viewing and illumination angles, where $k_i(w,h,i)$ substitute for $k_i(w)$ in one occurrence and $R_m(w)$ is replaced by $R_m(w,h,i)$ in the equation.

17. (Once Amended) The method according to claim 13 wherein ~~the surface contribution to appearance or~~ the surface reflection values $k_i(w,h,i)$ ~~is fixed~~ do not change in step (f).

18. (Once Amended) The method according to claim ~~15~~13 wherein the ~~kind of~~ material does not change in step (f).

19. (Cancel)

20. (Once Amended) The method of claim ~~15~~13 wherein:

step ~~C.~~(c) comprises the steps of calculating an idealized reflectance value $R_i(w)$ of the test object using an equation from a color theory, independent of the viewing and illumination angles h,i, ~~on the basis of the~~ using color determining parameters of the material from which the test object is manufactured ~~which~~ that are ~~determined~~ dictated by ~~the chosen kind of~~ what material and ~~the chosen~~ added colorants and/or other additives comprise the test object, and ~~subsequently~~

step (d) comprises calculating $R_p(w,h,i,)$ using an equation from a color theory, which equation ~~known per se~~ has been assumed to be independent of the viewing and illumination angles ~~(h,i)~~and that defines a relation between the idealized reflectance value(s) $R_i(w)$, ~~the~~ angle-independent surface reflection value(s) $k_1(w)$ and ~~the~~ angle-independent reflectance value(s) $R_p(w)$ such as it would be measured, with $R_p(w,h,i)$ being determined using this equation by setting $R_p(w,h,i)$ equal ~~=~~to $R_p(w)$ and one $k_1(w)$ is changed to $k_1(w,h,i)$ in this equation and by subsequently solving $R_p(w,h,i)$ from this equation on the basis of the idealized reflectance value(s) $R_i(w)$ and the surface reflection $k_1(w,h,i)$.

21. (Once Amended) The method of claim 20 wherein the color determining parameters ~~of the material~~ are calculated ~~on the basis of parameters determining the kind of material such as the~~ from absorption coefficient K_{pol} and scattering coefficient S_{pol} of ~~the material~~ a polymer comprising an object and ~~parameters~~ absorption coefficient K_{pig} and scattering coefficient S_{pig} of ~~the~~ colorants and/or other additives ~~such as the absorption coefficient K_{pig} and the scattering coefficient S_{pig} of the colorant~~ comprising an object, wherein the object is the test object for step (c) and the sample object for step (d).

22. (Once Amended) The method of claim 20 wherein the $R_{mref}(w,h,i)$ ~~is~~ values are determined ~~on the basis of~~ from a reference object.

23. (Once Amended) The method of claim ~~23~~20 wherein the method is carried out for a plurality or a range of values for the frequency (w).

24. (Once Amended) The method of claim ~~16~~13 wherein the sample object is transparent or translucent.

25. (Cancel)